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CEMP-C

Subject: Metric Steel Reinforcing Bars

Applicability: GUIDANCE

1. The purpose of this Construction Bulletin is to provide information on the availability and use of metric sizes in reinforcing steel on Corps projects. As outlined in CB 95-2, Metric Design Policy was disseminated for Military Construction on 21 November 1994 and new project designs should reflect metric after 1 January 1994.


2. The Construction Metrication Council announced a decision on 24 January 1995 that ASTM metric bar sizes established prior to 1980 would be the standard for the United States. These sizes have already been adopted in Canada. There are eight sizes ranging from #10 (100 square mm) to #55 (2500 square mm). See table 1.

3. The current Inch-Pound standard for reinforcing steel previously in use has, of course, eleven standard sizes. These may continue to be used where metric sizes are difficult or impossible to obtain. The General Services Administration (GSA) and Federal Highway Administration (FHWA) have adopted similar policies.

4. This gives rise to the question of what equivalent size bar to use if a transition is to be made from either standard to the other. Table 2 shows a comparison of the ASTM metric bar sizes given in Table 1 to the familiar inch-pound standard. As can be seen, the three sizes that do not have a close equivalent metric size are the old #4, #7, and #10 reinforcing bars. If a design has been calculated using metric standards and a conversion is necessary, these three sizes would probably not be used. If the reverse is the case, normally the next larger equivalent size would be substituted for these three sizes. This is not necessarily always the case since the maximum steel to concrete area ratio might be exceeded. In some cases, the conversion may result in the use of a smaller rather than a larger bar.

5. Until there is a greater commitment on the part of American reinforcing steel manufacturers to these metric standards, there will probably be instances where a conversion becomes necessary. Designs should require Government approval of any substitutions and provide for no increase in contract cost if a conversion is made. Any such conversion or substitution should be fully evaluated by the structural designer. Eventually Industry will become more used to metric standards and they will become the norm for design and construction.

This Construction Bulletin has been coordinated with HQUSACE's Military Programs Engineering Division (CEMP-EA & CEMP-ET), Civil Works Engineering (CECW-ED), and Civil Works Construction (CECW-OC).



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CURRENT ASTM METRIC REBAR SIZES

Bar No.	Nominal	
	Diameter, mm	Area, mm ²
10	11.3	100
15	16.0	200
20	19.5	300
25	25.2	500
30	29.9	700
35	35.7	1000
45	43.7	1500
55	56.4	2500

TABLE 1

CURRENT ASTM METRIC BAR SIZES vs. INCH-POUND BARS

Metric			Inch-Pound	
Bar No.	Area, mm ²	Equiv. Area, in. ²	Bar No.	Area, in. ²
			3	0.11
10	100	0.16	4	0.20
15	200	0.31	5	0.31
20	300	0.47	6	0.44
			7	0.60
25	500	0.78	8	0.79
30	700	1.09	9	1.00
			10	1.27
35	1000	1.55	11	1.56
45	1500	2.32	14	2.25
55	2500	3.87	18	4.00

TABLE 2